IN THE SPECIFICATION

Please amend the paragraph beginning on page 2, line 1 as follows:

In this configuration, the magneto-resistive effect element having a so-called CIP (Current In Plane) type configuration in which a sense current, i.e., a detection current for detecting the change of resistance flows ~~though~~ through the plane direction of the lamination layer structure portion inevitably needs a relatively large width, i.e., a large ~~large~~ area in order to obtain a predetermined conducting sectional area by a cross-section in the film thickness direction.

Please amend the paragraph beginning on page 2, line 16 as follows:

On the other hand, the magneto-resistive effect element has a so-called CPP (Current Perpendicular to Plane) type configuration in which a sense current flows through the lamination layer direction of the above-mentioned lamination layer structure portion, i.e., in the direction perpendicular to the lamination layer film can decrease its area. In a magnetic head, for example, since its magnetic sensing portion can be made compact in size, the whole of the magneto-resistive effect element can be reduced in size. In accordance therewith, this ~~become~~ becomes advantageous in increasing a recording density.

Please amend the paragraph beginning on page 3, line 5 as follows:

In the GMR effect element having the SVMR configuration or the MR effect element having the TMR configuration, the hard magnetic layer which is magnetized in the predetermined direction is disposed in order to maintain the magnetic stability of the free layer.

This hard magnetic layer can cancel a magnetic domain produced at the end portion of the free layer and can suppress a Barkhausen noise ~~caused~~ due to discontinuity of magnetization rotation by a magnetic domain existing at the end portion of the free layer when an external magnetic field, i.e., a signal magnetic field from a magnetic recording medium is introduced into this free layer.

Please amend the paragraph beginning on page 3, line 16 as follows:

Since a hard magnetic layer having a high electric conductivity generally is ~~generally~~ used as this hard magnetic layer, in general, in the CPP type magnetic head, the hard magnetic layer is disposed so as to oppose [[to]] only the free layer. This free layer is projected to the side of other lamination film having a conductivity comprising the lamination layer structure portion. In this projected portion, the free layer is brought in contact with the hard magnetic layer so that the occurrence of a leakage of a sense current which directly flows through this hard magnetic layer to other lamination layer film having a conductivity bypassing the free layer can be avoided. Thus, it is possible to avoid a magneto-resistive conversion efficiency from being lowered due to this leakage current.

Please amend the paragraph beginning on page 6, line 6 as follows:

This lamination layer structure portion has [[an]] a configuration in which opposing side surfaces of one flat surface or a continuous one curved surface are formed over at least the free layer, the first and second spacer layers disposed across this free layer and the first and second fixed layers in its lamination layer direction.

Please amend the paragraph beginning on page 6, line 23 as follows:

In a magnetic head using magneto-resistive effect according to the present invention, a magnetic sensing portion which generates the change of resistance by a signal magnetic field introduced from a magnetic recording medium has the configuration of each magneto-resistive effect element based upon the above-mentioned SVMR configuration or TMR configuration.[[,]]

Please amend the paragraph beginning on page 12, line 4 as follows:

On the other hand, when the positional relationship between the hard magnetic layer and the free layer is selected in such a manner that the central portions of both of the hard magnetic layer and the free layer in the film thickness directions substantially agree with each other, i.e., the planes in which both of the hard magnetic layer and the free layer are disposed are not flush with each other, the magnetic field from the hard magnetic layer can be applied to the free layer effectively and effects for canceling magnetic domains of other portions of the free layer can be improved more. Thus, the stability of the free layer and, accordingly, the improvement of the Barkhausen ~~noise can~~ noise, can be increased.

Please separate the paragraph beginning on page 12, line 22 as follows:

FIG. 1 is a schematic plan view in a process of an example of a manufacturing method according to the present invention.

FIG. 2 is a schematic cross-sectional view taken along the line A-A in FIG. 1.

FIG. 3 is a schematic cross-sectional view in a process of an example of a manufacturing method according to the present invention.

FIG. 4 is a schematic cross-sectional view in a process of an example of a manufacturing method according to the present invention.

FIG. 5 is a schematic plan view in a process of an example of a manufacturing method according to the present invention.

FIG. 6 is a schematic cross-sectional view taken along the line A-A in FIG. 5.

FIG. 7 is a schematic cross-sectional view taken along the line B-B in FIG. 5.

FIG. 8 is a schematic plan view in a process of an example of a manufacturing method according to the present invention.

FIG. 9 is a schematic cross-sectional view taken along the line A-A in FIG. 8.

FIG. 10 is a schematic cross-sectional view taken along the line B-B in FIG. 8.

FIG. 11 is a schematic cross-sectional view in a process of an example of a manufacturing method according to the present invention.

FIG. 12 is a schematic plan view in a process of an example of a manufacturing method according to the present invention.

FIG. 13 is a schematic cross-sectional view taken along the line A-A in FIG. 12.

FIG. 14 is a schematic cross-sectional view in a process of an example of a manufacturing method according to the present invention.

FIG. 15 is a schematic cross-sectional view in a process of an example of a manufacturing method according to the present invention.

FIG. 16 is a schematic plan view in a process of an example of a manufacturing method according to the present invention.

FIG. 17 is a schematic cross-sectional view taken along the line A-A in FIG. 16.

FIG. 18 is a schematic plan view of a magnetic head using magneto-resistive effect according to an embodiment of the present invention.

FIG. 19 is a schematic cross-sectional view taken along the line A-A in FIG. 18.

FIG. 20 is a schematic cross-sectional view of a magnetic head using magneto-resistive effect according to other embodiment of the present invention.

FIG. 21 is a schematic perspective view of an example of a recording and reproducing magnetic head using the magnetic head according to the present invention.

FIG. 22 is a schematic plan view of a process of other example of a manufacturing method according to the present invention.

FIG. 23 is a schematic cross-sectional view taken along the line A-A in FIG. 22.

FIG. 24 is a schematic plan view of a process of other example of a manufacturing method according to the present invention.

FIG. 25 is a schematic cross-sectional view taken along the line A-A in FIG. 24.

FIG. 26 is a schematic plan view of a process of other example of a manufacturing method according to the present invention.

FIG. 27 is a schematic cross-sectional view taken along the line A-A in FIG. 26.

FIG. 28 is a schematic plan view of a process of an example of other embodiment according to the present invention.

FIG. 29 is a schematic cross-sectional view taken along the line A-A in FIG. 28.

FIG. 30 is a schematic cross-sectional view taken along the line B-B in FIG. 28.

FIG. 31 is a schematic cross-sectional view of a process of other example of a manufacturing method according to the present invention.

FIG. 32 is a schematic cross-sectional view of a process of other example of a manufacturing method according to the present invention.

FIG. 33 is a schematic plan view of a process of other example of a manufacturing method according to the present invention.

FIG. 34 is a schematic cross-sectional view taken along the line A-A in FIG. 33.

FIG. 35 is a schematic cross-sectional view of a process of other example of a manufacturing method according to the present invention.

FIG. 36 is a schematic plan view of a process of other example of a manufacturing method according to the present invention.

FIG. 37 is a schematic cross-sectional view taken along the line A-A in FIG. 36.

FIG. 38 is a schematic plan view of an example of a magnetic head using magneto-resistive effect according to the present invention.

FIG. 39 is a schematic cross-sectional view taken along the line A-A in FIG. 38.

FIG. 40 is a schematic plan view of other example of a magnetic head using magneto-resistive effect according to the present invention.

FIG. 41 is a schematic plan view of a process of a further example of a manufacturing method according to the present invention.

FIG. 42 is a schematic cross-sectional view taken along the line A-A in FIG. 4.1.

FIG. 43 is a schematic cross-sectional view of a process of a further example of a manufacturing method according to the present invention.

FIG. 44 is a schematic cross-sectional view of a process of a further example of a manufacturing method according to the present invention.

FIG. 45 is a schematic cross-sectional view of a process of a further example of a manufacturing method according to the present invention.

FIG. 46 is a schematic cross-sectional view of a process of a further example of a manufacturing method according to the present invention.

FIG. 47 is a schematic cross-sectional view of a process of a further example of a manufacturing method according to the present invention.

FIG. 48 is a schematic cross-sectional view of a process of a further example of a manufacturing method according to the present invention.

FIG. 49 is a schematic plan view of a process of a further example of a manufacturing method according to the present invention.

FIG. 50 is a schematic cross-sectional view taken along the line A-A in FIG. 49.

FIG. 51 is a schematic cross-sectional view taken along the line B-B in FIG. 49.

FIG. 52 is a schematic plan view of a process of a further example of a manufacturing method according to the present invention.

FIG. 53 is a schematic cross-sectional view taken along the line A-A in FIG. 52.

FIG. 54 is a schematic cross-sectional view taken along the line B-B in FIG. 52.

FIG. 55 is a schematic cross-sectional view of a process of a further example of a manufacturing method according to the present invention.

FIG. 56 is a schematic cross-sectional view of a process of a further example of a manufacturing method according to the present invention.

FIG. 57 is a schematic plan view of a process of a further example of a manufacturing method according to the present invention.

FIG. 58 is a schematic cross-sectional view taken along the line A-A in FIG. 57.

FIG. 59 is a schematic cross-sectional view taken along the line B-B in FIG. 57.

FIG. 60 is a schematic cross-sectional view of a process of a further example of a manufacturing method according to the present invention.

FIG. 61 is a schematic cross-sectional view of a process of a further example of a manufacturing method according to the present invention.

FIG. 62 is a schematic plan view of a process of a further example of a manufacturing method according to the present invention.

FIG. 63 is a schematic cross-sectional view taken along the line A-A in FIG. 62.

FIG. 64 is a schematic cross-sectional view taken along the line B-B in FIG. 62.

FIG. 65 is a schematic cross-sectional view of a further example of a magnetic head using magneto-resistive effect according to the present invention.

FIG. 66 is a schematic plan view of other example of a magnetic head using-magneto-resistive effect according to the present invention.

Please amend the paragraph beginning on page 19, line 4 as follows:

The fixed layer 6 can be made up of a trilayer structure of a CoFe layer having a thickness of 2 nm, [[a]] an Ru layer having a thickness of 1 nm and a CoFe layer having a thickness of 3 nm, for example.

Please amend the paragraph beginning on page 19, line 23 as follows:

Next, as FIG. 3 shows a cross-sectional view corresponding to the above-mentioned cross-section taken along the line A-A, while this mask 9 is being used as an etching mask in the patterning process, the protective layer 8, the antiferromagnetic layer 7, the fixed layer 6 and the spacer layer 5 are patterned by ion milling using a high-sensitivity end detector such as [[an]] a SIMS (Secondary Ion Mass Spectrometer), thereby forming a stripe-like lamination layer structure portion S1 which is extended in the width direction.

Please amend the paragraph beginning on page 23, line 21 as follows:

As FIG. 14 ~~show~~ shows a cross-sectional view corresponding to the above-mentioned cross-section taken along the line A-A, a groove G3 is formed by removing the portion which is not covered with this mask 16 according to ion milling, for example.

Please amend the paragraph beginning on page 26, line 20 as follows:

Moreover, in this magnetic head 22, the front surface 20 thereof is brought in contact with or is opposed to a magnetic recording medium. This front surface 20 serves as a so-called ABS (Air Bearing Surface) ~~surface~~ when the magnetic head 22, for example, can be lifted up by air flow generated when the magnetic head is moved in a relative fashion to the magnetic recording medium.

Please amend the paragraph beginning on page 30, line 23 as follows:

In this manner, ~~the~~ there can be constructed the recording and reproducing magnetic head in which the magneto-resistive effect type reproducing magnetic head 22 according to the present invention and the thin-film type recording head 30 are laminated and integrated with each other.

Please amend the paragraph beginning on page 32, line 14 as follows:

Moreover, the fixed layer 6 may have a trilayer structure comprising a CoFe layer having a thickness of 3 nm, [[a]] an Ru layer having a thickness of 1 nm and a CoFe layer having a thickness of 2 nm, for example.

Please amend the paragraph beginning on page 39, line 20 as follows:

Then, the GMR element having this configuration, i.e., the magneto-resistive effect element and the magnetic head using magneto-resistive effect 22 also, as shown in FIG. 39, has [[an]] a configuration in which the sense current Is flows through the first and second shield and electrode layers 2 and 19 from one to the other, i.e., the CPP configuration in which the sense current flows through the lamination layer direction of the lamination layer structure portion 12.

Please amend the paragraph beginning on page 43, line 9 as follows:

While the lamination layer structure portion 12 having the SVMR configuration is formed as a single SV configuration, free layers of the pair of SVMR configurations ~~may~~ may be made common and the lamination layer structure portions having the respective SVMR

configurations may be constructed on both surfaces of the free layer, whereby the detection output of the external magnetic field can be increased.

Please amend the paragraph beginning on page 44, line 15 as follows:

Each of the fixed layers 6A and 6B can be made up of a trilayer structure of a CoFe layer, [[a]] an Ru layer having a thickness of 1 nm and a CoFe layer. Then, in this case, the CoFe layer may have at its side in which it is brought in contact with the respective spacer layers 5A and 5B of the fixed layers 6A and 6B a thickness of 2 nm, and the CoFe layer may have at its opposite side a thickness of 3 nm.

Please amend the paragraph beginning on page 55, line 22 as follows:

Since the magnetic head including the magnetic sensing portion formed of the above-mentioned magneto-resistive effect element having the SVMR configuration or the TMR configuration according to the present invention have opposing side ~~surface~~ surfaces which are formed as one flat surface or continuous one curved surface with substantially the same width at least in the free layer into which the external magnetic field is introduced, the nearby layers, i.e., the spacer layer which serves as the substantial operating portion which can achieve the magneto-resistive effect, i.e., the nonmagnetic conductive layer or the tunnel barrier layer and in the fixed layer, the width of this portion can be reduced necessarily and sufficiently, and hence the sense current can be concentrated on this SVMR configuration portion or the TMR configuration portion, thereby making it possible to increase the magneto-resistive effect. Accordingly, there can be constructed the magneto-resistive effect element which can detect the

external magnetic field with high sensitivity or the magnetic head which can increase the detection output of the signal magnetic field from the magnetic recording medium.